



ACUTE ISCHEMIC STROKE

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(Eds.)

Acute Ischemic Stroke

Imaging and Intervention

With 107 Figures and 59 Tables

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Preface

Acute ischemic stroke is treatable. Rapidly evolving imaging technology is revolutionizing the management of the acute stroke patient, and the field of acute stroke therapy is undergoing positive change. This book is intended as a guide for a wide variety of clinicians who are involved in the care of acute stroke patients, and is a compendium on how acute stroke patients are imaged and managed at the Massachusetts General Hospital (MGH). The approaches delineated in this book derive from the published experiences of many groups, and the crucible of caring for thousands of acute stroke patients at the MGH. It is the result of the clinical experiences of the emergency department physicians, neurologists, neuroradiologists, and interventional neuroradiologists that comprise the acute stroke team.

This book focuses on *hyperacute* ischemic stroke, which we define operationally as that early period after stroke onset when a significant portion of threatened brain is potentially salvageable. The time period this encompasses will depend on many factors; it may only be a few minutes in some individuals or greater than 12 hours in others. In most people, this hyperacute period will encompass less than 6 hours when intervention is usually most effective.

The authors believe that patients with acute ischemic stroke can benefit most from the earliest possible definitive diagnosis and rapid, appropriate treatment. In the setting of hyperacute stroke, imaging plays a vital role in the assessment of patients. The most recent advances in imaging can identify the precise location of the occluded vessel, estimate the age of the infarcted core, and estimate the area at risk or the 'ischemic penumbra'. This book will cover

these modern imaging modalities; advanced computed tomography and magnetic resonance methods are considered in detail. These two modalities are emphasized because of their widespread availability and the rapid development of their capacities in the diagnosis of stroke. Only brief mention is made of other modalities because they are less widely available and less commonly used in the evaluation of hyperacute stroke patients.

Another major aspect of this book is the use of standard and developing interventions that aim to limit the size of a cerebral infarct and prevent its growth. With the approval of intravenous therapy using recombinant tissue plasminogen activator (rt-PA), this treatment is now in use throughout the United States, Canada, and Europe. Although this is a major advance in the treatment of acute stroke, the 3-hour 'window' for rt-PA makes this therapy suitable for only a minority of patients. Studies have indicated that intra-arterial thrombolysis is also effective in patients in a wider window up to 6 hour. More recently, phase II clinical studies have shown that intravenous therapy with a new fibrinolytic agent may be effective up to 9 hours after ischemic stroke onset in patients selected using imaging criteria. Thus, this approach is potentially available to many more individuals. Finally, a wide variety of novel and innovative new devices are being developed to mechanically recanalize the occluded vessel. It is likely that these devices will come into clinical use in the near future. The authors hope that their experiences as summarized in these pages are of value to the reader and, ultimately, the acute stroke patient.

R. Gilberto González

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